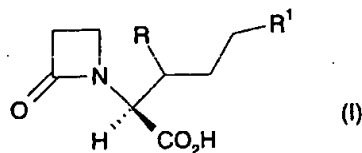
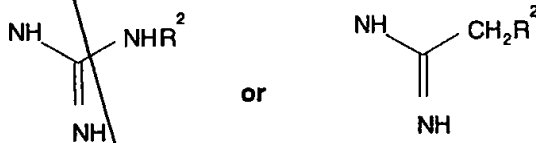


~~Claims~~ What is claimed is:

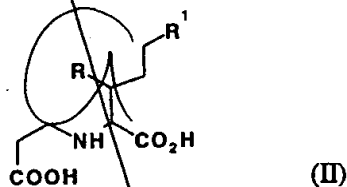
1. A process for preparing compounds of formula (I)



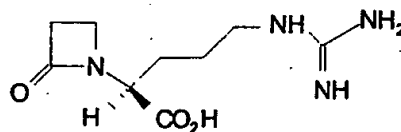
wherein R is H or OH and R<sup>1</sup> is



- and where R<sup>2</sup> = H or C<sub>1-6</sub> alkyl  
by contacting a compound of formula (II)

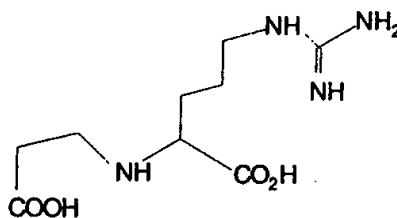


- where the variables are as defined in formula (I)  
with a polypeptide having at least 95% identity to the amino acid sequence of SEQ ID NO:2 over the entire length of SEQ ID NO:2 and having  $\beta$ -lactam synthetase activity.
2. A process according to claim 1 for preparing a compound of formula (IV)



(IV)

- 5 wherein the compound of formula (II) is N<sup>2</sup>-(2-carboxyethyl)-(S)-arginine; formula (III)



(III)

3. A process according to claim 1 or 2 wherein the polypeptide comprises the  
10 amino acid sequence of SEQ ID NO:2.
4. A process according to claim 1 or 2 wherein the polypeptide has the amino acid  
sequence of SEQ ID NO:2.
- 15 5. A process according to any one of claims 1 to 4 wherein the polypeptide having  
 $\beta$ -lactam synthetase activity is obtainable from *Streptomyces* species.
6. A process according to claim 5 wherein the *Streptomyces* species is  
*Streptomyces clavuligerus*.  
20
7. A recombinant vector comprising a polynucleotide capable of producing the  
polypeptide defined in claim 1 when said vector is present in a compatible host.
8. A recombinant vector according to claim 7 comprising a polynucleotide selected  
25 from the group:

- a) a polynucleotide encoding a polypeptide having at least 95% identity with the amino acid sequence of SEQ ID NO:2 over the entire length of SEQ ID NO:2;  
b) a polynucleotide comprising the polynucleotide sequence of SEQ ID NO:1; or  
c) a polynucleotide having the polynucleotide sequence of SEQ ID NO:1.

5

9. A process according to any one of claims 1 to 6 wherein the polypeptide is expressed from a recombinant vector according to claim 7 or 8.

10. A host microorganism containing a recombinant vector of claims 7 or 8.

10

11. A host microorganism according to claim 10 which is selected from *Streptomyces*, or *E.coli*.

15

12. A process for preparing an enzyme having  $\beta$ -lactam synthetase activity which comprises the steps:

- a) culturing *Streptomyces clavuligerus*,  
b) harvesting and lysing the mycelium, and  
c) isolating a polypeptide having at least 95% identity with the amino acid sequence of SEQ ID NO:2 over the entire length of SEQ ID NO:2, and having  $\beta$ -lactam synthetase activity.

20

13. A process for preparing an enzyme having  $\beta$ -lactam synthetase activity which comprises the steps:

- a) culturing a host microorganism transformed with a recombinant vector according to claims 7 or 8, and  
b) isolating the polypeptide having at least 95% identity with the amino acid sequence of SEQ ID NO:2 over the entire length of SEQ ID NO:2, and having  $\beta$ -lactam synthetase activity.

25

30 14. A process for preparing clavulanic acid comprising preparing a compound of formula (IV) in accordance with claim 2 or any claim dependent thereon, and then

converting the compound of formula (IV) to clavulanic acid by treatment with an enzyme system derived from *Streptomyces clavuligerus*.

add A17

add C5

09743209.100501

BEST AVAILABLE COPY